

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
14 October 2004 (14.10.2004)

PCT

(10) International Publication Number
WO 2004/088649 A3

(51) International Patent Classification⁷: **G11B 7/247**,
C09B 45/20, 45/22, 56/00

(21) International Application Number:
PCT/EP2004/050206

(22) International Filing Date: 25 February 2004 (25.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03100908.7 4 April 2003 (04.04.2003) EP
03102687.5 2 September 2003 (02.09.2003) EP

(71) Applicant (for all designated States except US): **CIBA SPECIALTY CHEMICALS HOLDING INC.** [CH/CH]; Klybeckstrasse 141, CH-4057 Basel (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ADAM, Jean-Marie** [FR/FR]; 60 D, rue de Village-Neuf, F-68128 Rosenau (FR). **AESCHLIMANN, Peter** [CH/CH]; Sandweg 16, CH-4123 Allschwil (CH). **BACHER, Jean-Pierre** [FR/FR]; 9, rue des Vergers, F-68220 Buschwiller (FR).

BUDRY, Jean-Luc [CH/CH]; 52, rue des Oeuches, CH-2842 Rossemaison (CH). **LEHMANN, Urs** [CH/CH]; Unterer Rheinweg 50, CH-4057 Basel (CH). **MORTON, Colin** [GB/CH]; Breisacherstrasse 30, CH-4057 Basel (CH). **SCHMIDHALTER, Beat** [CH/CH]; Dahlienstrasse 25, CH-4416 Bubendorf (CH). **SPAHNI, Heinz** [CH/CH]; Eggstrasse 23, CH-4402 Frenkendorf (CH).

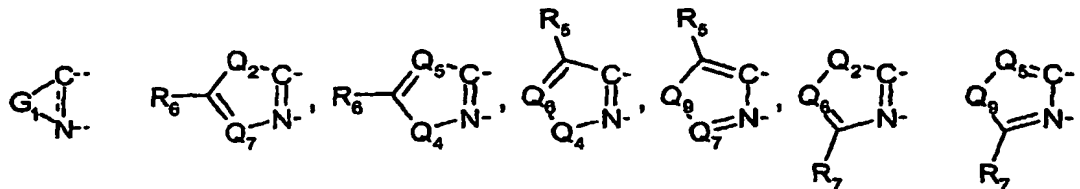
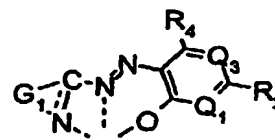
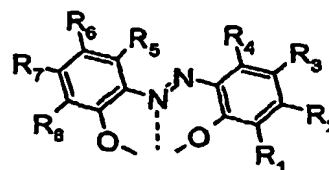
(74) Common Representative: **CIBA SPECIALTY CHEMICALS HOLDING INC.**; Patent Department, Klybeckstrasse 141, CH-4057 Basel (CH).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: HIGH-CAPACITY OPTICAL STORAGE MEDIA



(57) Abstract: The invention relates to an optical recording medium comprising a substrate, a reflecting layer and a recording layer, wherein the recording layer comprises a compound of formula $[L_1M_r-4L-2]_0 [A^m]_p [Z^{n+}]_q$ (I), $[L_1M_r-3L-3]_0 [A^m]_p [Z^{n+}]_q$ (II) or $[L_3M^{r-2}L_4]_0 [A^m]_p [Z^{n+}]_q$ (III), or where applicable a mesomeric or tautomeric form thereof, wherein L_1 and L_2 are each independently of the other and L_3 and L_4 are each independently of the other wherein Q_1 is CR₁ or N, Q_2 is SO₂, S, NR₁₀ or $Q_3=Q_8$, Q_3 is CR₃ or N, Q_4 is O, S, NR₁₀ or $Q_7=Q_8$, Q_5 is CR₅ or N, Q_6 is CR₆ or N, Q_7 is CR₇ or N, Q_8 is CR₈ or N, and Q_9 is O, S, NR₁₀ or $Q_6=Q_8$; M^r , A^m , Z^{n+} , R_2 , R_9 are as defined in the claims.



GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
18 November 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/050206

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G11B7/247 C09B45/20 C09B45/22 C09B56/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G11B C09B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, IBM-TDB, COMPENDEX, CHEM ABS Data, BEILSTEIN Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 10, 17 November 2000 (2000-11-17) & JP 2000 198273 A (TDK CORP), 18 July 2000 (2000-07-18) cited in the application *tables on pages 5 and 12* abstract	1-9
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 08, 30 June 1999 (1999-06-30) & JP 11 058977 A (TDK CORP), 2 March 1999 (1999-03-02) *tables starting on pages 5, 10 and 13* abstract	1-10
	----- -/-- -----	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

6 July 2004

Date of mailing of the international search report

30. 09. 2004

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Härtinger, S

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/050206

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 02, 5 February 2003 (2003-02-05) & JP 2002 293031 A (RICOH CO LTD; HODOGAYA CHEM CO LTD), 9 October 2002 (2002-10-09) cited in the application *compound no. 1, 3-5, 8-16* abstract	1-9
X	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 07, 29 September 2000 (2000-09-29) & JP 2000 118145 A (TDK CORP), 25 April 2000 (2000-04-25) *tables starting on pages 6, 10 and 14* abstract	1-10
X	US 5 851 621 A (SCHMIDHALTER BEAT ET AL) 22 December 1998 (1998-12-22) cited in the application column 5, line 62 - column 6, line 40; claim 6	1-9
X	US 6 242 067 B1 (KAMBE EMIKO ET AL) 5 June 2001 (2001-06-05) cited in the application column 7, line 20 - column 10, line 50; claims; example 2; tables 1,2	1-9
X	US 6 168 843 B1 (KAMBE EMIKO ET AL) 2 January 2001 (2001-01-02) cited in the application *compound no. 2, 19, 22, 24, C-6, C-7, D-21, D-22* column 3, line 29 - line 53; claims 1,12-15	1-9
A	PATENT ABSTRACTS OF JAPAN vol. 1998, no. 05, 30 April 1998 (1998-04-30) & JP 10 006651 A (RICOH CO LTD), 13 January 1998 (1998-01-13) abstract	1-9
P,X	WO 03/098617 A (SCHMIDHALTER BEAT ; LEHMANN URS (CH); BUDRY JEAN-LUC (CH); MORTON COLI) 27 November 2003 (2003-11-27) cited in the application page 29 - page 31; claims 1,4 page 27; example 74 page 66 - page 68	1-9

-/--

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/050206

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 03/098618 A (AESCHLIMANN PETER ; SCHMIDHALTER BEAT (CH); LEHMANN URS (CH); BUDRY JE) 27 November 2003 (2003-11-27) cited in the application page 31 - page 32; claims 1,4; example 48 page 59 - page 61	1-9
X	EP 0 483 387 A (MITSUBISHI CHEM IND) 6 May 1992 (1992-05-06) claim 5; examples 5-7,15,16; table 3	1-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2004/050206

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-9 (part)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9(part)

formula (I)

2. claims: 1-10(part)

formula (II)

3. claims: 1-10(part)

formula (III)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/050206

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 2000198273	A	18-07-2000	NONE	
JP 11058977	A	02-03-1999	NONE	
JP 2002293031	A	09-10-2002	NONE	
JP 2000118145	A	25-04-2000	NONE	
US 5851621	A	22-12-1998	CA 2204209 A1 DE 59710824 D1 EP 0805441 A1 JP 10097732 A	03-11-1997 13-11-2003 05-11-1997 14-04-1998
US 6242067	B1	05-06-2001	JP 3441410 B2 JP 2000190642 A	02-09-2003 11-07-2000
US 6168843	B1	02-01-2001	CA 2247338 A1 DE 69728971 D1 EP 0887202 A1 WO 9829257 A1 JP 3364231 B2	09-07-1998 09-06-2004 30-12-1998 09-07-1998 08-01-2003
JP 10006651	A	13-01-1998	JP 3412078 B2	03-06-2003
WO 03098617	A	27-11-2003	WO 03098617 A2	27-11-2003
WO 03098618	A	27-11-2003	WO 03098618 A1	27-11-2003
EP 0483387	A	06-05-1992	DE 69112337 D1 DE 69112337 T2 EP 0483387 A1 HK 1000162 A1 US 5330542 A CA 2063579 A1 WO 9118950 A1 JP 7051682 B KR 160944 B1 US 5389419 A	28-09-1995 02-05-1996 06-05-1992 09-01-1998 19-07-1994 26-11-1991 12-12-1991 05-06-1995 15-12-1998 14-02-1995